Smythe GD (undated) Survey of the coast of Port Phillip from the mouth of Tangenong Creek to Arthur's seat with the internal features (duplicate copies).

Stuwe J, Parsons RF (1977) *Themeda australis* grasslands on the basalt plains, Victoria: floristics and management effects. *Australian Journal of Ecology* **2**, 467-476.

Sutton CS (1916-1917) A sketch of the Keilor Plains flora. *The Victorian Naturalist* **33**, 112-123, 128-143.

Tuckey JH (1804) *Port Phillip in Bass's Strait surveyed by JH Tuckey 1st Lieutenant of HMS Calcutta Oct 1804*. (London)

Vickery JW (1970) A taxonomic study of the genus *Poa L.* in Australia. *Contributions from the NSW National Herbarium* **4**, 145-243.

Willis JH (1964) Vegetation of the basalt plains in western Victoria. *Proceedings of the Royal Society of Victoria* **77**, 397-418.

Yugovic J, Mitchell S (2006) Ecological review of the Koo-Wee-Rup Swamp and associated grasslands. *The Victorian Naturalist* **123**, 323-334.

Yugovic J (unpublished). EVC information for Mornington Peninsula Shire. Provided by the author (Available in modified form on *www.mornpen.vic.gov.au*; under 'Shire Planting Guides')

Received 17 August 2006; accepted 18 January 2007

Use by birds and mammals of habitats of different complexity in remnant and revegetated sites in the Wannon Catchment, Western Victoria

Anne M Wallis[1], Daniel Jamieson[1] and Robert L Wallis[2]

[1] School of Life and Environmental Sciences, Deakin University, Warrnambool, Victoria 3280
[2] Office of the Pro Vice-Chancellor, Deakin University, Warrnambool, Victoria 3280

Abstract
Extensive land clearing in western Victoria has lead to land degradation, loss of natural habitat and poor water quality. Tree planting has been used to combat these problems and improve biodiversity, but whether these programs are meeting their nature conservation objectives is equivocal. Here we examined the presence of birds and mammals in 12 revegetated sites of different ages and habitat complexity and four remnant habitat sites. We found remnant sites had the greatest abundance in species richness of both birds and mammals, and that use of revegetated sites increased as the sites aged and became more structurally complex. (*The Victorian Naturalist* **124** (3), 2007, 149-156)

Introduction

Land clearing has contributed to degradation of land and water resources, increased greenhouse gases and the decline of biodiversity. Soils are especially affected by clearing and over-use, with acidity, erosion, salinity and fertility loss lowering agricultural production (Gretton and Salma 1996). Clearing has also changed landscapes, often with few remaining patches of vegetation present in a larger matrix of crops or pasture grasses. Such patchiness may limit movements of fauna, thus reducing genetic diversity (Merriam and Saunders 1993; Deacon and Mac Nally 1998). Habitat destruction and fragmentation is considered a leading cause of the decline of biodiversity in Australia (Hobbs and Hopkins 1990; Recher 1993).

Revegetation is one strategy used to reduce these deleterious effects of land clearing. However, most revegetated patches are small, fragmented and linear with high edge to area ratios. Their value (and those of small and often linear remnants) in terms of mammal and bird conservation has only recently received attention, and the conclusions have been equivocal (Bennett 1990; Lynch and Saunders 1991; Hobbs 1993; Crome *et al.* 1994; Downes *et al.* 1997; Deacon and Mac Nally 1998; Rossi 2001). Recent studies of this kind that have been undertaken in south-eastern Australia have included Ryan (2000), Rossi (2003) and Loyn (2005).

Here we report on a study designed to measure presence of mammals and birds in remnant vegetation patches and in revegetated sites of different ages and structural complexity to see if revegetation can indeed help to provide suitable habitat for vertebrates, thus ameliorating the effects of land clearing on biodiversity.

Methods

We conducted the study in the catchment of the Wannon River in western Victoria where only 1.9% of the catchment area consists of remnant forest blocks (Glenelg-Hopkins Catchment Management Authority 2000). There has been a program of revegetation in the area for over 20 years, principally on private land in the form of windbreaks, grown along fence lines or in rows of less than 30 m width.

Sixteen sites were chosen, four of which were remnant sites at least 200m long. 'Remnant' here refers to patches of vegetation left uncleared after European settlement and having a natural structural complexity (Kimber *et al.* 1999). Sites were selected from a small pool of possibilities using the following selection criteria: size, accessibility, age of revegetation, availability of historical information, and connectivity.

The revegetated sites were grouped into four age classes: 0-5 years (3 sites), 5-10 years (3), 10-15 years (3) and over 15 years (3). All sites were fenced to prevent access to stock and thus allow for regeneration of grasses and shrubs, and were at least 200 m long. All sites were within 20 km of each other and within 15 km of the Wannon River. Geology, soils and climate were thus similar (Jamieson 2002).

The vegetation community is best described as Dry Red Gum Woodland (Land Conservation Council 1979) dominated by River Red Gum *Eucalyptus camaldulensis*, Yellow Gum *E. leucoxylon* and Manna Gum *E. viminalis* with a ground cover of Austral Bracken *Pteridium esculentum* and various species of Poaceae. Drier patches of Dry Heathy Forest (Land Conservation Council 1979) have Brown Stringybark *E. baxteri* and Messmate *E. obliqua* with Austral Grass Tree *Xanthorrhoea australis* and Smooth Parrot Pea *Dillwynia glaberrima* abundant. *Acacia* spp. and *Allocasuarina* spp. are common middle-storey plants. The species used in revegetation include eucalypts listed above as well as some Swamp Gum *E. ovata*, Blue Gum *E. globulus*, Sugar Gum *E. cladocalyx* and Scent Bark *E. aromaphloia*. Shrubs were also usually planted or grew naturally once fencing excluded stock. These included Salt Paperbark *Melaleuca halmaturorum*, Scrub She-oak *Allocasuarina paludosa*, Slaty She-oak *Allocasuarina muelleriana*, Woolly Teatree *Leptospermum lanigerum*, Blackwood *Acacia melanoxylon*, Black Wattle *Acacia mearnsii* and Silver Wattle *A. dealbata*.

At each site a 200 m transect line was laid out using a 50 m tape and yellow flagging tape to identify 25 m intervals. Transect lines were located in the centre of the sites in the large patches (e.g. remnant sites 2, 3 and 6) at no less than 5 m from the vegetation edge. At 25 m intervals along the transect the following attributes were measured: plant species present, percentage of vegetation cover (% cover observed in overstorey, understorey and ground cover), vegetation structure (number of touches on a ranging pole), presence of tree hollows, hollow logs and groundcover (leaf litter and grasses). We also measured the 'patchiness' of the vegetation along the 200 m transect as the number of gaps in vegetation that exceeded 10 m length.

Each transect was walked three times for one hour in early morning and late afternoon over a 10 week period, covering spring and summer in 2001/2002. Birds seen or heard within 5 m of the transect line were identified and recorded. Evidence of breeding and presence of nests were recorded.

Mammals were detected at the same time, using direct observation or indirect signs (scats, footprints, diggings, skeletal remains) using Triggs (1998). Elliott folding aluminium traps baited with peanut butter, rolled oats and honey were also used. Each site was trapped five times (60 trap-nights per site). Traps were placed randomly along the transect lines at least 25 m apart. Each transect line was spotlit once for nocturnal mammals.

We used an ordinal scaling system

instead of habitat component counts to determine average abundances. This system is a useful way of standardising data when making statistical comparisons (e.g. for comparing habitat components with bird abundances).

Weeds and introduced mammals can deleteriously affect the presence of native species (Hobbs 1993, Panetta and Hopkins 1991). We noted the relative abundance of these exotic species.

Results

Habitat structure

The remnant sites were found to be more complex than the revegetated sites (Fig. 1). The microhabitat components (native grasses, leaf litter and rocky areas), vegetation densities, and the number of hollow logs were the structural components that contributed most to this difference. The data have been modified to allow comparison using arcsine transformation (Krebs 1999). The percentage values recorded for the variables were normalised and converted to a 0-5 abundance scale (1: 10%; 2: 10-25%, 3: 25-50%, 4: 50-75%, 5: >75%). Pair wise tests using ANOSIM (Krebs 1999) indicated the younger classes of vegetation (<10 years old) showed the greatest difference in structural complexity compared with the remnant sites (Jamieson 2002). SIMPER (similarity percentage) analysis (Clark and Gorley 2001) showed that for the three youngest revegetated sites, microhabitat components contributed the most to the structural differences between these sites and remnant sites, while vegetation density was the most significant feature that distinguished the older revegetated sites (>15 years old) from the remnant sites (Jamieson 2002).

Birds

Table 1 shows 45 species of birds were recorded (5 most abundant, 0 absent). The most frequently detected species are widespread and common and include the Willie Wagtail *Rhipidura leucophrys*, Crimson Rosella *Platycercus elegans*, Sulphur-crested Cockatoo *Cacatua tenuirostris*, Eastern Rosella *P. eximus*, Australian Magpie *Gymnorhina tibicen* and Little Raven *Corvus mellori*. Six species of parrots were seen.

The remnant vegetation sites had the highest abundance of birds and highest species richness. Abundance of birds increased with age of revegetation. More species were found in the remnant sites (38) than the revegetated ones, although interestingly more were also found in the younger revegetated sites (27 in the <5

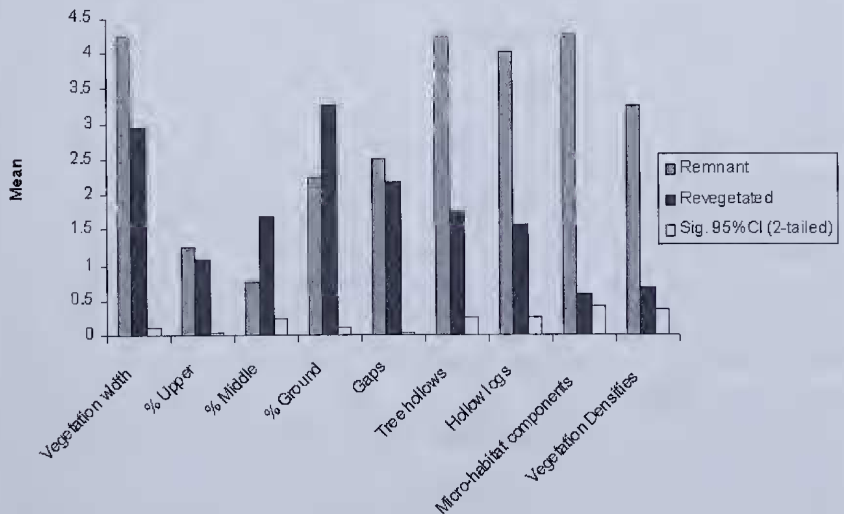

Fig. 1. Comparison of the mean ratings (max. 5) for structural habitat components found in the remnant and the combined revegetated sites.

Table 1. Species of birds found in each age group

Estimated level of abundance (0 low - 5 high score). Refer to methods on scoring system. Columns show vegetation age classes.

Common name	Scientific name	Remnant	1-5	5-10	10-15	15+
Family CASUARIIDEA						
Emu	*Dromaius novaehollandiae*	4	0	0	0	0
Family PHASIANIDAE						
Brown Quail	*Coturnix ypsilophora*	3	0	0	0	0
Family ANATIDAE						
Australian Shelduck	*Tadorna tadornoides*	0	1	1	0	0
Australian Wood Duck	*Chenonetta jubata*	2	1	1	0	0
Pacific Black Duck	*Anas superciliosa*	0	1	1	0	0
Family ARDEIDAE						
White-faced Heron	*Egretta novaehollandiae*	1	1	1	0	0
Family THRESKIORNITHIDAE						
Straw-necked Ibis	*Threskiornis spinicollis*	0	0	0	4	0
Family ACCIPITRIDAE						
Wedge-tailed Eagle	*Apuila audax*	2	0	0	1	0
Little Eagle	*Hieraaetus morphnoides*	2	0	0	0	2
Whistling Kite	*Haliastur sphenurus*	2	2	2	2	2
Family FALCONIDAE						
Brown Falcon	*Falco berigora*	0	2	2	3	2
Family CHARADRIIDAE						
Masked Lapwing	*Vanellus miles*	0	1	1	0	0
Family CACATUIDAE						
Yellow-tailed Black Cockatoo	*Calyptorphynchus funereus*	2	2	2	0	2
Sulphur-crested Cockatoo	*Cacatua galerita*	5	4	4	2	3
Family PSITTACIDAE						
Little Lorikeet	*Glossopsitta pusilla*	3	0	3	0	4
Crimson Rosella	*Platycerus elegans*	5	3	3	4	5
Eastern Rosella	*Platycercus eximius*	4	3	3	4	4
Red-rumped Parrot	*Psephotus haematonotus*	2	5	5	0	3
Family CUCULIDAE						
Pallid Cuckoo	*Cuculus pallidus*	2	0	0	0	0
Family TYTONIDAE						
Barn Owl	*Tyto alba*	0	0	0	1	0
Family STRIGIDAE						
Southern Boobook	*Ninox novaeseelandiae*	2	0	0	0	0
Family PODARGIDAE						
Tawny Frogmouth	*Podargus strigoides*	1	0	0	0	0
Family HALYCONIDAE						
Laughing Kookaburra	*Dacelo novaeguineae*	1	2	2	2	2
Family CLIMACTERIDAE						
White-throated Treecreeper	*Cormobates leucophaeus*	0	0	0	0	2
Family MALURIDAE						
Superb Fairy-wren	*Malurus cyaneus*	4	2	2	0	3
Family PARDALOTIDAE						
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	2	2	2	3	0
Brown Thornbill	*Acanthiza pusilla*	3	1	1	3	0
Family MELIPHAGIDAE						
White-naped Honeyeater	*Melithreptus lunatus*	2	0	0	2	2
Yellow-faced Honeyeater	*Lichenostomus chrysops*	4	1	1	3	0
New Holland Honeyeater	*Phylidonyris novaehollandiae*	3	3	3	3	3
Little Wattlebird	*Anthochaera chrysoptera*	3	0	0	2	0

Table 1. (Cont.)

Common name	Scientific name	Remnant	1-5	5-10	10-15	15+
Family PETROICIDAE						
Flame Robin	*Petroica phoenicea*	5	1	1	0	2
Jacky Winter	*Microeca fascinans*	0	0	0	0	2
Family PACHYCEPHALIDAE						
Grey Shrike-thrush	*Colluricincla haromica*	3	2	2	0	0
Family DICRURIDAE						
Willie Wagtail	*Rhipidura leucophrys*	5	5	5	3	4
Grey Fantail	*Rhipidura fuliginosa*	3	1	0	4	4
Magpie-lark	*Grallina cyanoleuca*	2	0	1	0	2
Family CAMPEPHAGIDAE						
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	2	0	0	0	0
Family ARTAMIDAE						
Grey Currawong	*Strepera versicolour*	3	0	1	3	3
White-browed Woodswallow	*Artamus superciliosus*	3	0	0	0	0
Australian Magpie	*Gymnorhina tibicen*	4	1	2	3	3
Family CORVIDAE						
Little Raven	*Corvus mellori*	3	4	4	3	4
Family CORCORACIDAE						
Apostle Bird	*Struthidea cinerea*	2	0	0	0	0
Family PASSERIDAE						
Red-browed Finch	*Neochmia temporalis*	3	0	0	0	0

year old sites, 28 in the 5-10 year old sites) than in the older ones (21 species in the 10-15 year old sites and 23 in the >15 year old sites). Nine species were only ever seen in remnant sites. Birds were often seen flying from one site to another of a different age. For example, a New Holland Honeyeater *Phylidonyris novaehollandiae* was seen to nest in a 12-year-old site and forage in a nearby 8-year-old site. Nests were detected only in sites that were >15 years old or remnant sites. However, foraging occurred in all sites.

While bird nests were found only in the remnant sites and the older revegetated ones, all sites were found to provide foraging habitat for birds. Nine species occurred only in the remnant sites; some, such as the Emu and Brown Quail, in reasonably high numbers.

Mammals

Table 2 shows that more mammal species were detected in the remnant sites (15) than in the revegetated sites (5, 7, 11 and 9 for the four groups of sites in order of increasing age). Four species were detected only in the remnant sites: Western Grey Kangaroo *Macropus fuliginosus*, Red-necked Wallaby *M. rufogriseus*, Brush-tailed Phascogale *Phascogale tapoatafa* and Swamp Rat *Rattus lutreolus*. Evidence of four mammal species was found in sites of all ages: Eastern Grey Kangaroo *M. giganteus*, Red Fox *Vulpes vulpes*, Rabbit *Oryctolagus cuniculus* and House Mouse *Mus domesticus*. Other introduced species (Cats *Felis catus* and Black Rats *R. rattus*) were widespread and common, being absent from only one (Cat – 1-5 year old) or two (Black Rat – remnant and > 15 years old) age classes of vegetation.

A number of species were found only in remnant sites and in revegetation that was >10 years old: Black Wallaby *Wallabia bicolor*, Common Ringtail Possum *Pseudocheirus peregrinus*, Common Brushtail Possum *Trichosurus vulpecula*, Yellow-bellied Glider *Petaurus australis*, Koala *Phascogale cinereus*, Agile Antechinus *Antechinus agilis* (as well as the four detected only in remnant sites). The Short-beaked Echidna *Tachyglossus aculeatus* was found in the 5-10 and 10-15 year age class sites as well in remnant vegetation.

Table 2. Presence/absence survey results on mammal species at study sites.X = present, - = absent * = Listed as found in the study area by the Atlas of Victorian wildlife.s = sighted, c = scat identified, h = heard call, t = trapped, d = digging/tracks

Common Name	Scientific Name	Detection method	Remnant	1-5	5-10
Native mammals					
Eastern Grey Kangaroo (s,c)	*Macropus giganteus* *	s,c	X	X	X
Western Grey Kangaroo (s)	*Macropus fuliginosus*	s	X	-	-
Swamp Wallaby (s, c)	*Wallabia bicolor*	s,c	X	-	-
Red-necked Wallaby (s)	*Macropus rufogriseus*	s	X	-	-
Common Ringtail Possum (s, c)	*Pseudocheirus peregrinus**	s,c	X	-	-
Common Brush-tail Possum (s,c)	*Trichosurus vulpecula**	s,c	X	-	-
Brush-tailed Phascogale (c)	*Phascogale tapoatafa* *	c	X	-	-
Yellow-bellied Glider (h, s?)	*Petaurus australis*	h,s	X	-	-
Koala (s, c)	*Phascolarctos cinereus* *	s,c	X	-	-
Agile Antechinus (t)	*Antechinus agilis*	t	-	-	-
Swamp Rat (t)	*Rattus lutreolus*	t	X	-	-
Short-beaked Echidna (d, s)	*Tachyglossus aculeatus*	d,s	X	-	X
Introduced mammals					
Red Fox (s, c, d)	*Vulpes vulpes* *	s,c,d	X	X	X
Cat (s, c)	*Felis catus* *	s,c	X	-	X
Rabbit (s, c)	*Oryctolagus cuniculus*	s,c	X	X	X
Black Rat (t)	*Rattus rattus*	t	-	X	X
House Mouse (t)	*Mus domesticus*	t	X	X	X
Total No. of species		15	5	7	

Relationship between habitat complexity and fauna abundace

As the complexity of the habitat increased, the average number of birds and mammals seen on each survey increased. When Spearman's rank correlation was used to assess if a relationship existed between relative structural complexity values and abundance of all animals seen, there was a strong correlation for birds but not for mammals (Table 3). However, we found there was a positive relationship between vegetation density and abundance of native mammals (p=0.03). Factors which produced significant correlations for birds were vegetation density (p=0.03), tree hollows (p=0.05) and microhabitat components (p=0.04).

Exotic species

ANOSIM (Bray Curtis) analysis indicated there were no significant differences in the numbers of introduced carnivorous mammals (foxes, dogs, cats), herbivorous mammals (rabbits), and weeds between the four different aged revegetated sites and the remnant sites. However, weeds were observed to be most abundant in the younger sites. Introduced pasture grasses such as Smooth Meadow-grass *Poa pratensis*, Yorkshire Fog *Holcus lanatus* and Cocksfoot *Dactylis glomerata* were the most common weeds present, along with Patterson's Curse *Echium plantagineum* and Serrated Tussock *Nassella trichotoma.*

Discussion

Over $6 million is spent annually on revegetation of degraded lands in Victoria (Griffin 1999). Bennett (2000) has noted that whilst tree planting has been extensive in rural Australia over the last 15 years, only 2% of plantings have had as their main purpose conservation of flora and fauna. Nonetheless, most proponents of revegetation will state biodiversity conservation is an important consequence even if it is not the main purpose of such habitat improvement (Hobbs 1993, Bennett *et al.* 2000). Thus, some authors have questioned whether revegetation in small patches is of value, mainly because the patchiness impedes free movement of populations.

Our results show that in the Wannon catchment, revegetated areas do indeed provide habitat for mammals and birds as suggested by Bennett *et al.* (2000) and Hobbs (1993). This result concurs with work by Loyn (2005) who examined use of plantations by wildlife in north-eastern Victoria. Importantly, we found that as the

Table 3. Spearman's rank correlation coefficient of the relationship between species presence and habitat features. Upper number is correlation co-efficient, lower number level of significance. * indicates correlation is significant at 0.05 level.

Habitat Feature	Class Aves	Class Mammalia
Gaps	.301 .258)	.000 1.000
Tree hollows	.499* .049	.688 .199
Hollow logs	.493 .052	.688 .199
Micro-habitat components	.519* .040	.825 .086
Veg. Densities	.538* .032	.918* .028
% Upper	.260 .331	.395 .511
% Middle	-.096 .725	-.564 .322
% Ground	-.176 .514	-.821 .089

vegetation aged, its structural complexity increased and this provided for more species and higher numbers of animals. Remnant and revegetated sites mainly differed structurally in terms of vegetation densities and microhabitat components such as percentage cover by native grasses and leaf litter. In the early stage, plants in the upper and middle vegetation strata grow close together; as the plot ages and the upper layers become less dense, more light is able to reach the ground. Bennett *et al.* (2000) have noted the importance of microhabitat features such as leaf litter, mossy patches, rocks and grasses in providing habitat for invertebrates and small vertebrates. To date, revegetation schemes in the Wannon catchment have ignored microhabitat features. However, even though there has been no deliberate consideration of the establishment of a grassy understorey, we found that sites > 10 years old had a substantial level of litter and native grasses (Poaceae), especially *Themeda triandra*. Furthermore, as vegetation aged, weed levels decreased. While ANOSIM did not detect significant differences in the number of exotic mammals in the five groups of sites, remnant sites had fewer foxes and rats than the early stages of revegetation. This is hardly surprising, as disturbance enhances colonisation by introduced species (Krebs 1999).

The bird species we detected have been found to be common in revegetated riparian strips in the same region (Merritt and Wallis 2004). There were no introduced bird species detected. In their similar study in the nearby Dundas Tablelands, Merritt and Wallis (2004) found only four introduced species (from 43 bird species) and these constituted only 63 of 5075 bird sightings. More birds and more species of birds were found in the remnant sites than in the revegetated ones. However, the relationship between age of vegetation and species richness was not linear, as more species were seen in the younger than the older revegetated sites.

Only two native mammal species (Eastern Grey Kangaroo and Short-beaked Echidna) were detected in sites <10 years old. On the other hand, there were nine species that were only found in sites >10 years old. The detection of Yellow-bellied Gliders (*P. australis)* in regrowth (15+ years old) is especially significant given the gliders' dependence on hollows that usually develop only in mature trees (Smith and Hume 1984). In turn, this indicates that adequate shelter, hollows and/or food are found only in the older sites. These observations are consistent with those of other workers. For example, Rossi (2001) concluded that richness and abundance of small mammals in south-eastern Australia depended on the age and structural complexity of the vegetation, while Deacon and Mac Nally (1998) found a direct correlation between the number of arboreal mammals and the number of tree hollows in central Victoria as demonstrated by Wilson *et al.* (1990). Connectivity of vegetation as well as complexity is also important for the presence and abundance of small mammals. Thus Crome *et al.* (1994) found no mammals used planted windbreaks that were isolated from remnant vegetation, while Rossi (2001) found mammals did use revegetated sites providing they were connected to established vegetation. In our study area, there were sufficient proximate remnant sites to allow for colonisation of mammals and certainly birds.

We conclude that revegetated, fenced and relatively wide (at least 20 m) plantations can provide habitat for native birds and mammals in western Victoria and that their value in terms of biodiversity conservation increases as the patches become older and more structurally complex.

Acknowledgements
We thank the Glenelg Hopkins Catchment Management Authority for financial support, and especially Peter Waldron for assisting with site selection. Landholders Bruce and Lyn Milne, Dan Dalohoy and the Waggs family are thanked for allowing access to their properties. Gordon Blake and Sarah Halligan are thanked for field assistance.

References

Bennett AF (1990) Land use, forest fragmentation and the mammalian fauna at Naringal, south-western Victoria. *Australian Wildlife Research* **17**, 325-347.

Bennett AF (2000) Future directions in revegetation: Will biodiversity issues receive greater consideration? In *Directions in revegetation and regeneration in Victoria: Proceedings of a forum held at Greening Australia*, May 5 and 6, Heidelberg, Victoria. pp 101-107. Eds MJ McDonnell and NS Williams (Australian Research Centre for Urban Ecology: Cranbourne)

Bennett AF, Kimber S and Ryan P (2000) Revegetation and Wildlife – A guide to enhancing revegetated habitats for wildlife conservation in rural environments. Bushcare National Projects Research and Development Program, Research Report 2/00, Melbourne.

Clark KR and Gorley RN (2001) *Primer v5: User Manual/Tutorial*. (Primer-E: Plymouth)

Crome F, Isaacs J and Moore L (1994) The utility of birds and mammals of remnant riparian vegetation and associated windbreaks in the tropical Queensland uplands. *Pacific Conservation Biology* **1**, 328-343.

Deacon JN and Mac Nally R (1998) Local extinction and nestedness of small mammal faunas in fragmented forest in central Victoria. *Pacific Conservation Biology* **4**, 122-131.

Downes SJ, Handasyde KA and Elgar MA (1997) The use of corridors by mammals in fragmented Australian eucalypt forests. *Conservation Biology* **11**, 718-726.

Glenelg-Hopkins Catchment Management Authority (2000) Draft Glenelg-Hopkins Native Vegetation Plan (Glenelg-Hopkins Catchment Management Authority: Hamilton)

Gretton P and Salma U (1996) Land Degradation and the Australian Agricultural Industry (Commonwealth of Australia: Canberra)

Griffin NRM (1999) Native Vegetation National Overview (Commonwealth of Australia, Environment Australia: Canberra)

Hobbs RJ (1993) Can revegetation assist in the conservation of biodiversity in agricultural areas? *Pacific Conservation Biology* **1**, 29-38.

Hobbs RJ and Hopkins AJM (1990) From frontiers to fragments: European impact on Australia's vegetation. *Proceedings of the Ecological Society of Australia* **16**, 93-114.

Jamieson D (2002) A comparison of habitat complexity and fauna use, between remnant vegetation and revegetated sites within the Wannon catchment. (Unpublished BSc Hons Thesis, Deakin University)

Krebs CJ (1999) *Ecological Methodology* (Benjamin Cummings: Merlo Park)

Kimber SL, Bennett AF and Ryan PA (1999) Revegetation and Wildlife: What do we know about revegetation and wildlife conservation in Australia? A report to Environment Australia. (School of Ecology and Environment, Deakin University: Burwood)

Land Conservation Council (1979) *Report on the South-Western Area, District 2*. (Land Conservation Council: Melbourne)

Loyn R (2005) Plantations can benefit wildlife. *Victorian Landcare and Catchment Management* **34**, 10-11.

Lynch JF and Saunders DA (1991) Responses of bird species to habitat fragmentation in the wheatbelt of Western Australia: interiors, edges and corridors. In *Nature Conservation 2: The Role of Corridors*, pp 143-158. Eds DA Saunders and RJ Hobbs (Surrey Beatty: Chipping Norton, NSW)

Merriam G and Saunders DA (1993) Corridors in restoration of fragmented landscapes. In *Nature Conservation 3: Reconstruction of Fragmented Ecosystems*, pp 71-87. Eds DA Saunders, RJ Hobbs and PR Ehrlich (Surrey Beatty: Chipping Norton, NSW)

Merritt B and Wallis R (2004) Are wide revegetated riparian strips better for birds and frogs than narrow ones? *The Victorian Naturalist* **121**, 288-292.

Panetta FD and Hopkins AM (1991) Weeds in corridors: invasion and management. In *Nature Conservation 2: The Role of Corridors*, pp 341-351. Eds DA Saunders and RJ Hobbs (Surrey Beatty: Chipping Norton, NSW)

Recher HF (1993) The loss of biodiversity and landscape restoration: conservation, management, survival. An Australian perspective. In *Nature Conservation 3: The Reconstruction of Fragmented Ecosystems*, pp 141-151. Eds DA Saunders, RJ Hobbs and PR Ehrlich (Surrey Beatty: Chipping Norton, NSW)

Rossi S (2001) The use of revegetated habitats by mammals at Yellingbo Nature Reserve. (Unpublished BSc Hons Thesis, Deakin University)

Rossi S (2003) Birds, mammals and their habitat in a variegated landscape in the Western Strzelecki Ranges. (Unpublished MSc Thesis, Monash University)

Ryan PA (2000) The use of vegetated areas by vertebrate fauna in Australia: a review. In *Temperate Eucalypt Woodlands in Australia: Biology, Conservation, Management and Restoration*, pp 318-335. Eds RJ Hobbs and CJ Yates (Surrey Beatty: Chipping Norton, NSW)

Smith A and Hume I (1984) *Possums and Gliders* (Surrey Beatty: Chipping Norton, NSW)

Triggs B (1998) *Tracks, Scats and Other Traces: a Field Guide to Australian Mammals*. (Oxford University Press: Melbourne)

Wilson BA, Robertson D, Moloney DJ, Newell GR and Laidlaw WS (1990) Factors affecting small mammal distribution and abundance in the Eastern Otway Ranges, Victoria. *Proceedings of the Ecological Society of Australia* **16**, 379-394.

Received 23 June 2005; Accepted 22 March 2007